

Applicant : Richard S. Ginn
Appl. No. : 10/751,051
Examiner : Bruce Edward Snow
Docket No. : 15457.4008 (Formerly 704117.4009)

IN THE CLAIMS:

1. (Currently Amended) A method for assisting exhalation at a branch in a lung, the branch comprising a main passage, a first branch communicating with a relatively healthy region of the lung, and a second branch communicating with a relatively unhealthy region of the lung to be isolated, the method comprising:

providing a device comprising a tubular member including an inlet end, an outlet end, and an inner lumen and an outer surface extending therebetween, the device being provided with ~~comprising~~ a first valve disposed adjacent the outer surface of the tubular member, the first valve being configured to close for limiting flow along the outer surface from the inlet end towards the outlet end and configured to open for allowing flow along the outer surface from the outlet end towards the inlet end;

implanting the device in the branch such that the inlet end is disposed in the first branch, and the outlet end is disposed proximate the proximal region of the second branch, the first valve engaging a wall of the first branch, the first valve being configured to be open during inhalation and to be closed during exhalation to force air from the first branch to pass through the lumen into the main passage, thereby inducing a vacuum at the second branch for drawing air from the region to be isolated into the main passage, and

implanting a second valve in the second branch, the second valve being configured to be open during exhalation to allow air to be drawn from the region to be isolated into the main passage, and configured to be closed during inhalation to prevent air from being drawn into the region to be isolated.

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2. (Original) The method of claim 1, further comprising implanting a support structure within the branch, and wherein the step of implanting the device comprises securing the device to the support structure.

3. (Original) The method of claim 2, wherein the support structure comprises a tubular mesh that is expandable between a contracted condition for facilitating delivery into a lung, and an enlarged condition for engaging tissue at the branch.

4. (Original) The method of claim 2, wherein the device further comprises a support structure to which the tubular member is attached, and wherein the implanting step comprises securing the support structure to tissue at the branch.

5. (Original) The method of claim 4, wherein the support structure comprises a tubular mesh that is expandable between a contracted condition for facilitating delivery into a lung, and an enlarged condition for engaging tissue at the branch.

6. (Original) The method of claim 5, wherein the implanting step comprises advancing the tubular mesh in the contracted condition along a bronchial passage to the branch, and expanding the tubular mesh to engage a wall of the bronchial passage.

7. (Currently Amended) A method for assisting exhalation at a branch in a lung, the branch comprising a main passage, a first branch communicating with a first relatively healthy region of the lung, and a second branch communicating with a second relatively unhealthy region of the lung, the method comprising:

implanting a tubular device having a lumen which has ~~comprising~~ a smaller cross-section than the first branch narrow region within the first branch such that a distal first end of the tubular device is disposed in the first branch distal to the second branch, and a proximal second end of the tubular device

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is disposed proximate to the proximal region of the second branch such that, during exhalation, air flows proximally through the tubular device towards the main passage, thereby inducing a vacuum proximate the proximal region of the second branch for drawing air from the second branch region into the main passage.

8. (Currently Amended) The method of claim 7, wherein a ratio of cross-sections of the lumen of the tubular device narrow-region and the first branch is less than one, whereby flow from the first branch passing through the lumen of the tubular device narrow-region causes an increase in velocity of air exiting the second end of the tubular device compared with the velocity of air entering the first end of the tubular device, the increase in velocity inducing the vacuum.

9. (Currently Amended) The method of claim 7, wherein the tubular device is provided with comprises a first valve disposed adjacent an outer surface of the tubular device, the first valve being configured to close during exhalation to obstruct the flow of air around the exterior of the tubular device and to cause air to flow through the tubular device, and configured to open during inhalation for allowing substantially unobstructed flow between the main passage and the first branch.

10. (Original) The method of claim 9, wherein the implanting step comprises implanting a second valve across the second branch, the second valve configured to open during exhalation to allow air to be drawn from the second branch into the main passage, and configured to close during inhalation to obstruct air from being drawn into the second branch from the main branch.

11. (Currently Amended) The method of claim 7, wherein the tubular device member comprises a lumen having a substantially uniform diameter through which air flows through the device tubular member, ~~the lumen comprising the narrow region within the branch.~~

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12. (New) A method for assisting exhalation at a branch in a lung, the branch comprising a main passage, a first branch communicating with a first relatively healthy region of the lung, and a second branch communicating with a second relatively unhealthy region of the lung, the method comprising:

implanting a tubular device having a lumen having a narrow flow path within the first branch such that a first end of the tubular device is disposed in the first branch distal to the second branch, and a second end of the tubular device is disposed proximate the proximal region of the second branch such that, during exhalation, air flows through the tubular device towards the main passage, thereby inducing a vacuum proximate the second branch for drawing air from the second branch into the main passage wherein the tubular device is provided with a first valve disposed adjacent an outer surface of the tubular device, the first valve being configured to close during exhalation to obstruct the flow of air around the exterior of the tubular device and to cause air to flow through the tubular device, and configured to open during inhalation for allowing substantially unobstructed flow between the main passage and the first branch.

13. (New) The method of claim 13, wherein the implanting step comprises implanting a second valve across the second branch, the second valve configured to open during exhalation to allow air to be drawn from the second branch into the main passage, and configured to close during inhalation to obstruct air from being drawn into the second branch from the main branch.